NHDES-W-06-012

WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau
Land Resources Management

Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: RSA 482-A/ Env-Wt 100-900

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to Guidance Document A for instructions.

☒ Standard Review (Minimum, Minor or Major Impact) ☐ Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:

If mitigation is required a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if Mitigation is Required, please refer to the Determine if Mitigation is Required Frequently Asked Question.

Mitigation Pre-Application Meeting Date: Month: __ Day: __ Year: ____

☒ N/A - Mitigation is not required

3. PROJECT LOCATION:

Separate wetland permit applications must be submitted for each municipality that wetland impacts occur within.

ADDRESS: **US Route 1 Bypass**			TOWN/CITY: **Portsmouth**
TAX MAP: **na**	BLOCK: **na**	LOT: **na**	UNIT: **na**
USGS TOPO MAP WATERBODY NAME: **Hodgson Brook** ☐ NA		STREAM WATERSHED SIZE: **3.5 sq mi** ☐ NA	
LOCATION COORDINATES (If known): **43.069347, -70.778355** ☐ Latitude/Longitude ☐			

4. PROJECT DESCRIPTION:

Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. **DO NOT reply "See Attached" in the space provided below.**

The purpose of this project is to address the structural deficiencies of Bridge 192/106, a 5-cell concrete box culvert. The proposed project will address significant corrosion and deterioration of concrete on the ceiling, invert, and walls of the structure, and will upgrade the bridge rail. The bridge was added to the NHDOT Red List in 2011. The project will also address the perched outlet of the box culvert.

5. SHORELINE FRONTAGE:

☒ NA This does not have shoreline frontage. SHORELINE FRONTAGE:

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:

Please indicate if any of the following permit applications are required and, if required, the status of the application.

To determine if other Land Resources Management Permits are required, refer to the Land Resources Management Web Page.

Permit Type	Permit Required	File Number	Permit Application Status
Alteration of Terrain Permit Per RSA 485-A:17	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED
Individual Sewerage Disposal per RSA 485-A:2	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED
Subdivision Approval Per RSA 485-A	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED
Shoreland Permit Per RSA 483-B	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:

See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB 17 - 3417

b. ☐ Designated River the project is in ¼ miles of: _____ ; and date a copy of the application was sent to the Local River Management Advisory Committee: Month: __ Day: __ Year: ____

☒ N/A

8. APPLICANT INFORMATION (Desired permit holder)

LAST NAME, FIRST NAME, M.I.: **Adams, Joseph**

TRUST / COMPANY NAME: **NHDOT Bridge Design** | MAILING ADDRESS: **7 Hazen Drive**

TOWN/CITY: **Concord** | STATE: **NH** | ZIP CODE: **03302**

EMAIL or FAX: **Joseph.Adams@dot.nh.gov** | PHONE: **(603) 271-2731**

ELECTRONIC COMMUNICATION: By initialing here: JCA, I hereby authorize NHDES to communicate all matters relative to this application electronically.

9. PROPERTY OWNER INFORMATION (If different than applicant)

LAST NAME, FIRST NAME, M.I.:

TRUST / COMPANY NAME: | MAILING ADDRESS:

TOWN/CITY: | STATE: | ZIP CODE:

EMAIL or FAX: | PHONE:

ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.

10. AUTHORIZED AGENT INFORMATION

LAST NAME, FIRST NAME, M.I.: **Perron, Christine** | COMPANY NAME: **McFarland Johnson**

MAILING ADDRESS: **53 Regional Drive**

TOWN/CITY: **Concord** | STATE: **NH** | ZIP CODE: **03301**

EMAIL or FAX: **CPerron@mjinc.com** | PHONE: **(603) 225-2978**

ELECTRONIC COMMUNICATION: By initialing here **cjp**, I hereby authorize NHDES to communicate all matters relative to this application electronically.

11. PROPERTY OWNER SIGNATURE:
See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.
12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned mail.

Property Owner Signature	Print name legibly	Date
Joseph C. Adams	Joseph C. Adams	5/23/2018

MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

⇨	Print name legibly	Date

DIRECTIONS FOR CONSERVATION COMMISSION

1. **Expedited review ONLY requires that the conservation commission's signature is obtained in** the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will be reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

⇨ Town/City Clerk Signature	Print name legibly	Town/City	Date

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

14. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.

Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland		☐ ATF		☐ ATF
Scrub-shrub wetland		☐ ATF	129	☐ ATF
Emergent wetland		☐ ATF		☐ ATF
Wet meadow		☐ ATF		☐ ATF
Intermittent stream		☐ ATF		☐ ATF
Perennial Stream / River	247 / 9	☐ ATF	2156 / 50	☐ ATF
Lake / Pond	/	☐ ATF	/	☐ ATF
Bank - Intermittent stream	/	☐ ATF	/	☐ ATF
Bank - Perennial stream / River	/	☐ ATF	548 / 40	☐ ATF
Bank - Lake / Pond	/	☐ ATF	/	☐ ATF
Tidal water	/	☐ ATF	/	☐ ATF
Salt marsh		☐ ATF		☐ ATF
Sand dune		☐ ATF		☐ ATF
Prime wetland		☐ ATF		☐ ATF
Prime wetland buffer		☐ ATF		☐ ATF
Undeveloped Tidal Buffer Zone (TBZ)		☐ ATF		☐ ATF
Previously-developed upland in TBZ		☐ ATF		☐ ATF
Docking - Lake / Pond		☐ ATF		☐ ATF
Docking - River		☐ ATF		☐ ATF
Docking - Tidal Water		☐ ATF		☐ ATF
Vernal Pool		☐ ATF		☐ ATF
TOTAL	247 / 9		2833 / 90	

15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

☐ Minimum Impact Fee: Flat fee of $ 200

☒ Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking) **3080** sq. ft. X $0.20 = **$ 616.00**

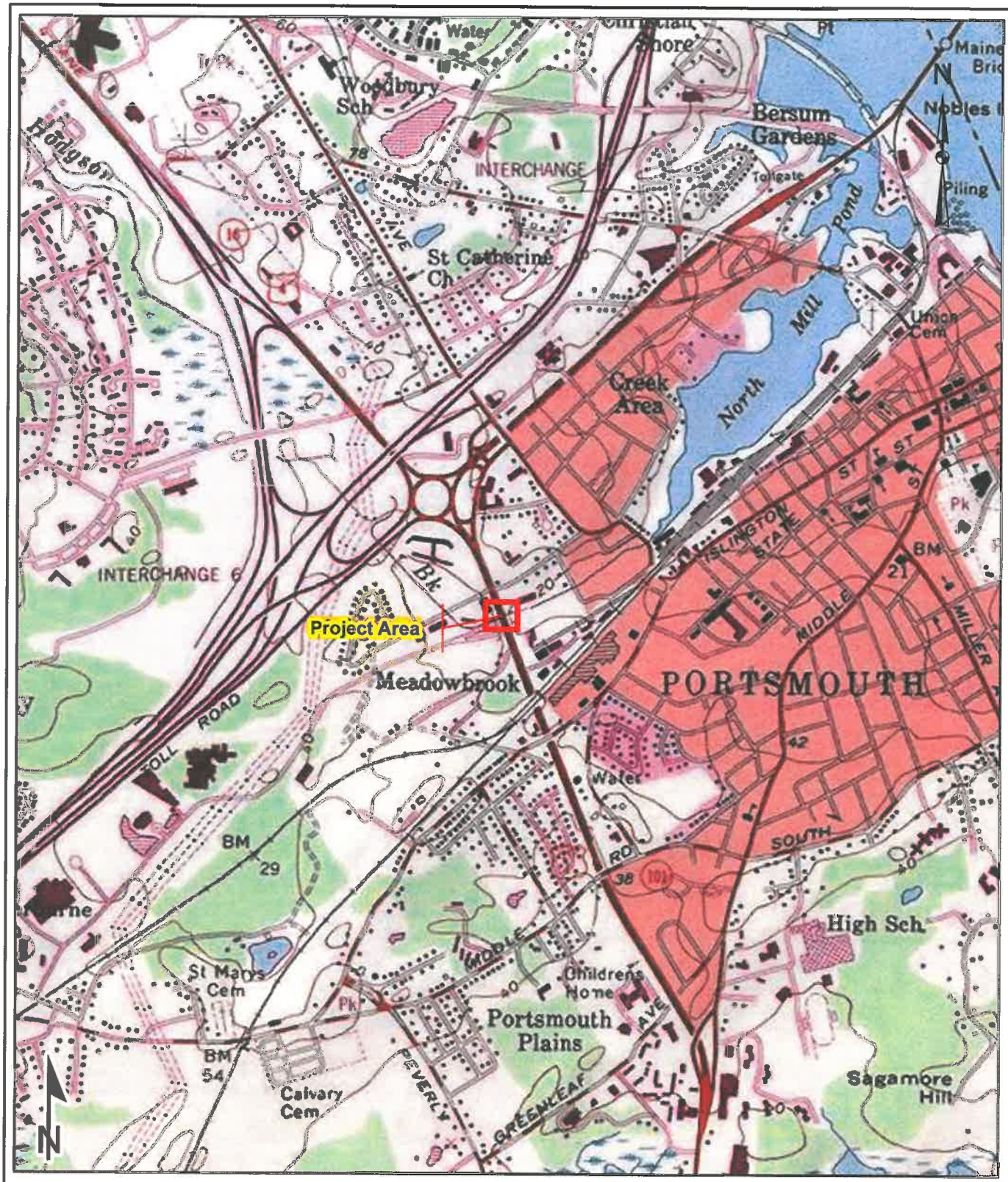
Temporary (seasonal) docking structure: _____ sq. ft. X $1.00 = **$** _____

Permanent docking structure: _____ sq. ft. X $2.00 = **$** _____

Projects proposing shoreline structures (including docks) add $200 =** **$ _____

Total = **$ 616.00**

The Application Fee is the above calculated Total or $200, whichever is greater = **$ 616.00**



NH DEPARTMENT OF TRANSPORTATION Portsmouth, X-A003(589), 27690 US Route 1 Bypass over Hodgson Brook (Bridge 192/106)		
USGS TOPOGRAPHIC MAP		
SCALE : 1 inch = 2,000 feet	DATE : October 2015	FIGURE : 1
McFarland Johnson		

WETLANDS PERMIT APPLICATION – ATTACHMENT A
MINOR AND MAJOR - 20 QUESTIONS

Land Resources Management
Wetlands Bureau

Check the Status of your application: www.des.nh.gov/onestop

RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

The purpose of this project is to address the structural deficiencies of Bridge 192/106, a 5-cell concrete box culvert. The proposed project will address significant corrosion and deterioration of concrete on the ceiling, invert, and walls of the structure, and will upgrade the bridge rail. The bridge was added to the NHDOT Red List in 2011. The project will also address the perched outlet of the box culvert, which is perched approximately 6" above the surface of the stream. This perch limits upstream fish passage.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

To address the perched outlet, imported streambed material will be placed at the outlet of the box culvert and shaped to grade up to the invert. Addressing the perched outlet to improve fish passage is the only reason permanent impacts to the stream will be necessary for this project.

3. The type and classification of the wetlands involved.

Hodgson Brook (R2UB1H)

Bank

PSS1E

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The project is located on Hodgson Brook, approximately 2,000 feet upstream of its confluence with North Mill Pond. Tidal influence does not reach upstream to the project area.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The impacts willl not be located in or near any rare wetland types, exemplary natural communities, or tidal areas.

6. The surface area of the wetlands that will be impacted.

Permanent impact to the channel of Hodgson Brook: 247 sq ft

Temporary impacts to channel, banks, and PSS1E: 2,833 sq ft

7. The impact on plants, fish and wildlife including, but not limited to:
   a. Rare, special concern species;
   b. State and federally listed threatened and endangered species;
   c. Species at the extremities of their ranges;
   d. Migratory fish and wildlife;
   e. Exemplary natural communities identified by the DRED-NHB; and
   f. Vernal pools.

The US Fish & Wildlife Service Information for Planning and Conservation (IPaC) Tool reported potential concern with northern long-eared bat. The NH Natural Heritage Bureau did not have recorded occurences for sensitive species or exemplary natural communities near the proposed project area.

Neither the Natural Heritage Bureau nor NH Fish & Game reported known bat hibernacula or roost trees in the vicinity of the project. The bridge was reviewed for evidence of bat roosting and no evidence was observed. Limited tree clearing will be required for construction access. All work will comply with the criteria of the USFWS-FHWA Rangewide Programmatic Consultation for Indiana Bat and Northern Long-Eared Bat. The USFWS has expressed no concern with the project as proposed.

The project will address the perched outlet of the box culvert, which is perched approximately 6" above the surface of the stream. This perch limits upstream fish passage. To address the perch and improve fish passage, imported streambed material will be placed at the outlet and shaped to grade up to the invert.

There are no vernal pools in the project area.

8. The impact of the proposed project on public commerce, navigation and recreation.

The bridge rehabilitation project is required to address deteriorating aspects of the bridge. Additionally, the perched condition of the bridge impedes upstream fish passage. Improving upstream fish passage could improve recreational angling opportunities.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The bridge rehabilitation is consistent with the existing use and not anticipated to have an impact on aesthetic aspects of the area.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

The bridge rehabilitation project is consistent with the existing use of the site and will not result in obstructions to public rights of passage or access.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

There are no anticipated impacts to upstream or downstream abutters.

12. The benefit of a project to the health, safety, and well being of the general public.

The proposed bridge rehabilitation will maintain public safety by addressing deteriorating bridge conditions.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

The project will not impact the quantity or quality of surface and ground water.

As proposed, the project will widen the bridge deck approximately 6" on each side to overhang the moment slab to provide a drip notch. This will result in an increase in impervious surface area of only 45 square feet, a negligible amount that will not change stormwater runoff.

All appropriate erosion and sediment control measures will be implemented to prevent adverse impacts to water quality during construction.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

The project is not anticipated to result in increased flooding, erosion, or sedimentation. All appropriate BMPs will be implemented during construction to prevent erosion and sedimentation.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

The project is not anticipated to reflect or redirect current or wave energy.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

All parties must comply with existing State and Federal regulations.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The project will not impact the overall functions and values of Hodgson Brook. The project will address the perched condition of the culvert, which will improve fish passage and stream continuity.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

No such sites exist in the vicinity of the project.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

No such sites existin in the vicinity of the project.

20. The degree to which a project redirects water from one watershed to another.

The project will not redirect water from one watershed to another.

Additional comments

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: March 21, 2018
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Matt Urban
Sarah Large
Ron Crickard
Steve Johnson
Doug Locker
Meli Dube
Joseph Adams
Mac Laurin
Ron Kleiner
Rebecca Martin
Josh Lafond
John Sargent
Tobey Reynolds

ACOE
Mike Hicks

EPA
Mark Kern

NHDES
Gino Infascelli
Lori Sommer
Ryan Duquette

NHF&G
John Magee

NH Natural Heritage Bureau
Amy Lamb

Consultants/Public Participants
Christine Perron
Kim Smith
Josh Lund

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:
(minutes on subsequent pages)

Finalization of the December 20th and January 21st Natural Resource Agency Meeting Minutes.....2
Eaton, #41864 (Non-Federal).....2
Madison, #40775 (Non-Federal).....2
Orford, #40366 (X-A004(371)).....3
Portsmouth, #27690 (X-A003(589)).....5
Bethlehem, #26763 (X-A004(296)).....6

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

material to prevent voids that could lead to hyporheic flow. He would check his files for a specification that addresses the placement of the underlying riprap to avoid this situation.

J. Magee asked if the proposed bridge would be higher. K. Smith replied that the elevation of the bottom chord on the new bridge would match the elevation of the existing bridge. The increased hydraulic capacity would be achieved by the longer span and elimination of a center pier.

J. Magee asked when construction would take place. He expected that white suckers would be in this stream and would be migrating/spawning in May. C. Perron noted that the project doesn't advertise for bids until late 2020, so it was too soon to determine what the construction sequence may be. She would note the concern with in-water work in May in the NEPA document and this concern could be discussed further when the permitting phase begins.

Gino Infascelli noted that he could include this site in an upcoming field review.

Lori Sommer noted that mitigation would not be required for the 57' span since it meets the stream crossing rules and the area has been previously impacted during flood repairs. She did ask that plantings be considered where possible. If the Department ultimately decides against the 57' span as the preferred alternative, then the proposed project would need to be revisited.

C. Perron stated that the NEPA document is scheduled to be completed this spring, and the permitting phase would begin in late 2018 or early 2019.

This project has been previously discussed at the 9/20/2017 Monthly Natural Resource Agency Coordination Meeting.

Portsmouth, #27690 (X-A003(589))

Christine Perron began by noting that the project had last been discussed at the January 2016 meeting. The project will address the bridge that carries US Route 1 Bypass over Hodgson Brook. The purpose of today's discussion is to review the proposed alternative and preliminary impacts. Since the last meeting, the alternatives analysis was completed and public input was received, and the proposed alternative is now rehabilitation.

Josh Lund and John Sargent provided an overview of the project. The bridge is located just south of the Portsmouth traffic circle. After consideration of potential future widening along this corridor in 20 to 30 years, rehabilitation of the bridge was determined to be more prudent than replacement. The bridge is comprised of five concrete boxes, with a total length of 45 feet and a width of 72 feet curb to curb. Each bay is 8' wide by 6.5' high. The rehab will address significant corrosion and deterioration of concrete on the ceiling, invert, and walls of the structure, and will upgrade the bridge rail. Stream flow is largely concentrated in three of the five boxes and water levels are generally shallow through the structure, with approximately 6" of water at normal flows.

Temporary impacts to jurisdictional areas will be required for construction access and water diversion. Permanent impacts will be required to address the perched outlet of the structure. Christine Perron noted that the floor of the bridge structure is perched approximately 6" above the surface of the stream. This perch limits upstream fish passage. This concern was raised by a few

groups, including the Hodgson Brook Local Advisory Committee. The right-of-way on the outlet side does not provide sufficient space for a weir or rock vane that would raise the water elevation. Therefore, to address the perch, imported streambed material will be placed at the outlet and shaped to grade up to the invert. The stone will result in approximately 200 sq ft of permanent impact along approximately 15 linear feet of channel. Since the stone is not required to address concerns with the structure itself, addressing fish passage is the only reason permanent impacts will be necessary for this project.

Mike Hicks asked if the stream is tidally influenced. C. Perron replied that it is freshwater with no tidal influence.

Gino Infascelli asked if the concrete invert of one of the cells could be lowered 1 to 2 inches to help provide deeper water for fish passage. J. Sargent responded that this would be possible. The upstream side of the structure has a 4" lip at the invert. The intent is to remove this lip in one cell to allow more water to enter the cell, resulting in 3" to 4" deeper flow than the other cells.

John Magee recommended using well-blended stone material to prevent voids that could lead to hyporheic flow, which would also create a barrier to fish passage.

Lori Sommer stated that mitigation would not be required since the stone would address fish passage concerns and could be considered self-mitigating.

Mike Hicks commented that there is a known bat hibernaculum in Portsmouth. C. Perron noted that it was not reported by the Natural Heritage Bureau. This likely means that it is not in the vicinity of the project, but she would look into this.

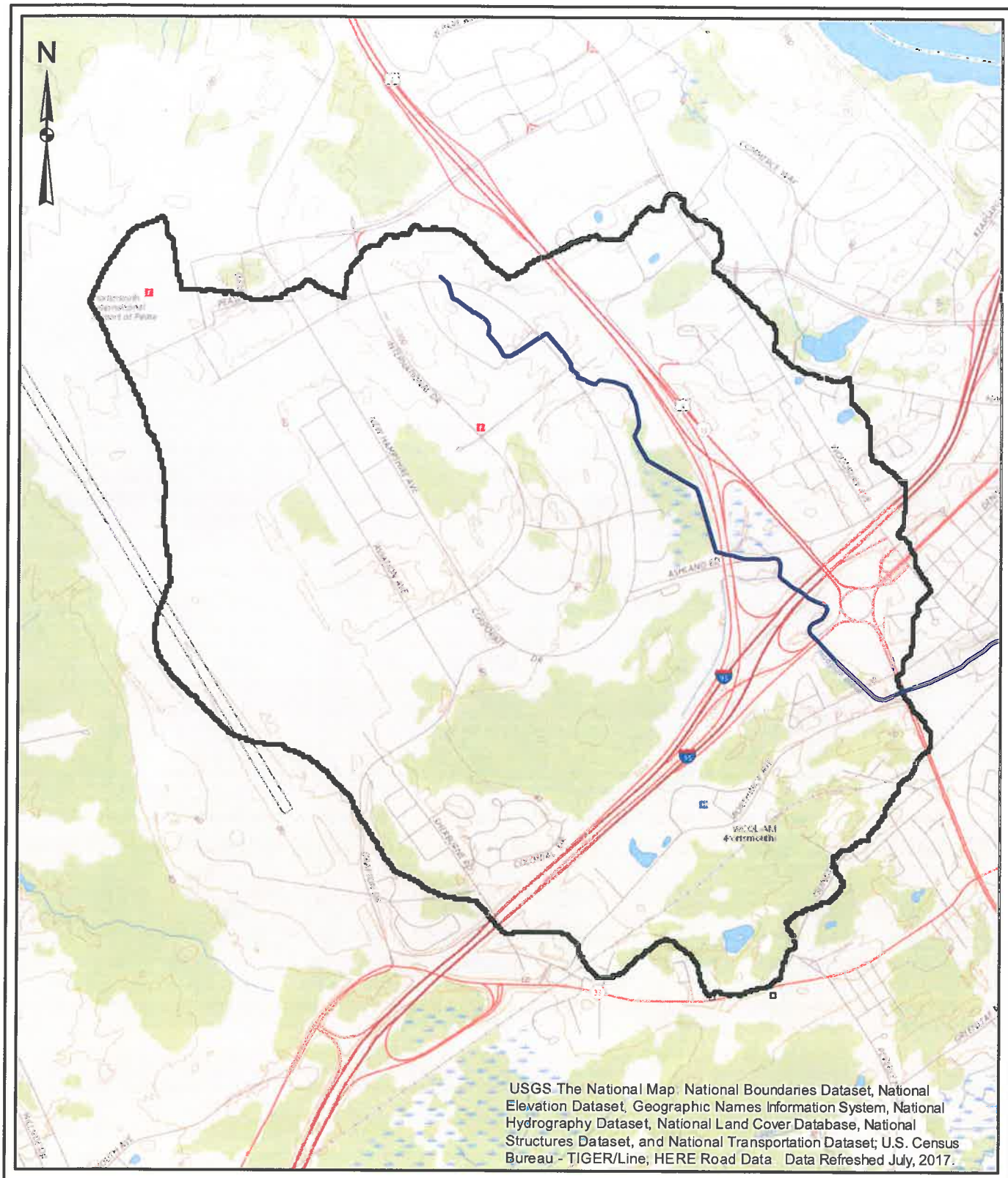
The project is scheduled to advertise in September 2018, so the permit application would be submitted within the next month.

This project has been previously discussed at the 1/20/2016 Monthly Natural Resource Agency Coordination Meeting.

Bethlehem, #26763 (X-A004(296))

The proposed project will address a culvert under Main Street (US Route 302) between Maple St (NH Route 142) and Congress Road in Bethlehem. The project had been reviewed previously (5/15/2015 and 11/16/2016). The Design team was returning to update the agencies on a modification to the design. The stream through the structure is a tributary to Barrett Brook. Josh Lafond explained that the culvert has been dubbed the 'Franken-culvert' because it is made up of several different materials. J. Lafond explained that there is a lot of impervious surface in the project area and showed pictures of the project area. He described that the culvert goes under a local business parking lot. At the inlet the culvert has around 7 feet of cover and at the outlet there is around 11 feet of cover.

J. Lafond described the poor condition of the structure including the currently perched condition of the outlet. He showed photos of the winter collapse of a catch basin, a sink hole, and the failing



Legend

- Hodgson Brook
- Hodgson Brook Watershed

0 2,000 4,000
Feet

NH DEPARTMENT OF TRANSPORTATION
Portsmouth, X-A003(589), 27690
US Route 1 Bypass over Hodgson Brook (Bridge 192/106)

Hodgson Brook Watershed Boundary

SCALE :	DATE :	FIGURE :
AS SHOWN	MAY 2018	2

McFarland Johnson

NH Department of Transportation
Bureau of Bridge Design
Portsmouth, 27690
Env-Wt 904.09 Alternative Design
TECHNICAL REPORT

Env-Wt 904.09(a) - If the applicant believes that installing the structure specified in the applicable rule is not practicable, the applicant may propose an alternative design in accordance with this section.

Please explain why the structure specified in the applicable rule is not practicable (Env-Wt 101.69 defines practicable as *available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes.)*
Hodgson Brook has a watershed of 3.5 square miles at the Interstate 89 bridges. The bankfull width at the location of the bridge is approximately 20 feet. The NH Stream Crossing Guidelines recommends crossings that are at least 1.2 times bankfull width plus 2 feet, resulting in a structure that spans the channel and at least a portion of the floodplain and provides for the adequate passage of water, sediment, aquatic biota, and organic matter at all flow levels.

Based on the metric used in the Stream Crossing Guidelines, the recommended span at this location would be 26 feet. The existing bridge is comprised of five concrete boxes, with a total length of 45 feet. Each bay is 8' wide by 6.5' high. Stream flow is largely concentrated in three of the five boxes.

After consideration of potential future work in the corridor, the proposed alternative to address deficiencies in the bridge is rehabilitation rather than replacement. The existing bridge adequately passes water and sediment, with no history of flooding at this location. The floor of the bridge structure is perched approximately 6" above the surface of the stream, which impedes upstream passage of aquatic organisms. The proposed rehabilitation will address this perch by placing imported streambed material at the bridge outlet to raise the elevation of the stream channel.

The proposed alternative meets the specific design criteria for Tier 2 and Tier 3 crossings to the *maximum extent practicable*, as specified below.

Env-Wt 904.05 Design Criteria for Tier 2 and Tier 3 Stream Crossings – New Tier 2 stream crossings, replacement Tier 2 crossings that do not meet the requirements of Env-Wt 904.07, and new and replacement Tier 3 crossings shall be designed and constructed:

(a) In accordance with the NH Stream Crossing Guidelines.
Based on the metric used in the Stream Crossing Guidelines, the recommended span at this location would be 26 feet. The existing bridge is comprised of five concrete boxes, with a total length of 45 feet. Each bay is 8' wide by 6.5' high. The existing bridge adequately passes water and sediment, with no history of flooding at this location. The floor of the bridge structure is perched approximately 6" above the surface of the stream, which impedes upstream passage of aquatic organisms. The proposed rehabilitation will address this perch by placing imported streambed material at the bridge outlet to raise the elevation of the stream channel.

(b) With bed forms and streambed characteristics necessary to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing.
Stream flow is largely concentrated in three of the five boxes and water levels are generally shallow through the structure, with approximately 6" of water at normal flows. The upstream side of the structure has a 4" lip at the

invert. The intent is to remove this lip in one cell to allow more water to enter the cell, resulting in 3" to 4" deeper flow than the other cells to more closely match water depths in the stream channel.

(c) To provide a vegetated bank on both sides of the watercourse to allow for wildlife passage.
The existing banks adjacent to the bridge will remain vegetated. The cells that contain shallow to no water during normal flows will continue to function as potential corridors for wildlife passage.

(d) To preserve the natural alignment and gradient of the stream channel, so as to accommodate natural flow regimes and the functioning of the natural floodplain.
The existing bridge alignment and gradient will remain the same.

(e) To accommodate the 100-year frequency flood, to ensure that (1) there is no increase in flood stages on abutting properties; and (2) flow and sediment transport characteristics will not be affected in a manner which could adversely affect channel stability.
The existing hydraulic capacity of the bridge will remain unchanged.

(f) To simulate a natural stream channel.
Imported streambed material will be placed at the bridge outlet to address the perched outlet and replicate a natural stream bottom. The floor of the box culvert will remain concrete.

(g) So as not to alter sediment transport competence.
The existing sediment transport competence will remain unchanged.

Env-Wt 904.09(c)(3) – The alternative design must meet the general design criteria specified in Env-Wt 904.01:

Env-Wt 904.01
(a) Not be a barrier to sediment transport;
The proposed rehabilitation will not be a barrier to sediment transport.

(b) Prevent the restriction of high flows and maintain existing low flows;
The proposed rehabilitation will not change the hydraulic capacity of the bridge. The upstream side of the structure has a 4" lip at the invert. The intent is to remove this lip in one cell to allow more water to enter the cell, resulting in 3" to 4" deeper flow than the other cells to more closely match water depths in the stream channel.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;
Imported streambed material will be placed at the bridge outlet to address the perched outlet.

(d) Not cause an increase in the frequency of flooding or overtopping of banks;
The proposed rehabilitation will not change the hydraulic capacity of the bridge and will not increase the frequency of flooding.

(e) Preserve watercourse connectivity where it currently exists;
Imported streambed material will be placed at the bridge outlet to improve watercourse connectivity.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and (2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;
Imported streambed material will be placed at the bridge outlet to improve watercourse connectivity.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and
The proposed rehabilitation will not change the hydraulic capacity of the bridge and will not cause erosion, aggradation, or scouring.

(h) Not cause water quality degradation.
The proposed rehabilitation will not result in degradation of water quality.

New Hampshire Natural Heritage Bureau

To: Christine Perron
53 Regional Drive
Concord, NH 03301

Date: 11/16/2017

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 11/16/2017

NHB File ID: NHB17-3471 Applicant: Christine Perron

Location: Tax Map(s)/Lot(s):
Portsmouth

Project Description: Bridge rehabiliation

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

This report is valid through 11/15/2018.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301

MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB17-3471

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301

Christine J. Perron

From: Tuttle, Kim [Kim.Tuttle@wildlife.nh.gov]
Sent: Friday, January 15, 2016 9:27 AM
To: Christine J. Perron
Cc: Henderson, Carol
Subject: FW: Portsmouth 27690, Hodgson Brook

Christine,

We would certainly be in favor of a clear span at this location. If you read through the emails below, it will give you some idea of the fish species that should be present.

Regards,

Kim Tuttle
Certified Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Dionne, Michael
Sent: Thursday, January 14, 2016 3:10 PM
To: Nugent, Benjamin; Tuttle, Kim
Subject: RE: Portsmouth 27690, Hodgson Brook

Yes I agree sea lamprey and herring would certainly have access to this location. We have never observed either directly though....

From: Nugent, Benjamin
Sent: Thursday, January 14, 2016 3:08 PM
To: Tuttle, Kim; Dionne, Michael
Subject: RE: Portsmouth 27690, Hodgson Brook

In 2014, we found several eels and killifish/mummichogs and a few common sunfish. It's likely the same species assemblage exists between the bypass and Bartlett St. I'm not sure about the possibility of clupeids or sea lamprey...it seems like they would have access to the stream.
Ben

From: Dionne, Michael
Sent: Thursday, January 14, 2016 3:08 PM
To: Tuttle, Kim; Nugent, Benjamin
Subject: RE: Portsmouth 27690, Hodgson Brook

Well not knowing exactly where the tide line is the only things I can say for certain that are likely to be in there are eels, sticklebacks and killifish.

From: Tuttle, Kim
Sent: Thursday, January 14, 2016 2:53 PM
To: Dionne, Michael; Nugent, Benjamin
Subject: RE: Portsmouth 27690, Hodgson Brook

What species do you think may be present?

From: Dionne, Michael
Sent: Thursday, January 14, 2016 2:52 PM
To: Tuttle, Kim; Nugent, Benjamin
Subject: RE: Portsmouth 27690, Hodgson Brook

I don't know how far the tidal portion goes. I know it's tidal up to at least Bartlett St. but not sure if it goes as far as Rt. 1. I do know that if they plan to replace the box culverts with a span I'm all for that.

Mike

From: Tuttle, Kim
Sent: Thursday, January 14, 2016 2:28 PM
To: Nugent, Benjamin; Dionne, Michael
Subject: RE: Portsmouth 27690, Hodgson Brook

They will be discussing this at the next DOT meeting. Do either of you have some knowledge of this one?

Hi Kim,

I will be discussing the subject project at next week's NHDOT Natural Resource Agency meeting. I just realized that I haven't heard back from you about the record of American eel downstream of the bridge. We will be addressing aquatic organism passage. Are there any other concerns we should be aware for the eel?

Thank you,
Christine

Christine Perron • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Tuttle, Kim
Sent: Friday, October 30, 2015 1:09 PM
To: Nugent, Benjamin; Dionne, Michael
Subject: FW: Portsmouth 27690, Hodgson Brook

I have zippo details on this one but let me know if you want to comment on eels.

Kim

From: Christine J. Perron [mailto:CPerron@mjinc.com]
Sent: Thursday, October 29, 2015 3:51 PM
To: Tuttle, Kim
Subject: Portsmouth 27690, Hodgson Brook

Hi Kim,

The NHB memo was just sent for the subject project. The intent of the project is to address Bridge 192/106, which carries Hodgson Brook under US Route 1 Bypass. The alternatives analysis is just getting underway, and McFarland Johnson is assisting NHDOT with the design and environmental review. I'm attaching a photo of the bridge from downstream.

Given the record of American eel just downstream from the bridge, do you have any feedback on the project at this early stage?

Thanks very much.
Christine

Christine Perron • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Lamb, Amy [mailto:Amy.Lamb@dred.nh.gov]
Sent: Thursday, October 29, 2015 3:41 PM
To: Christine J. Perron
Cc: Tuttle, Kim
Subject: NHB review: NHB15-3387

Attached, please find the review we have completed. If your review memo includes potential impacts to plants or natural communities please contact me for further information. If your project had potential impacts to wildlife, please contact NH Fish and Game at the phone number listed on the review.

Best,
Amy

Note: Melissa Coppola is still working part-time on reviews, but I am now the reviewer at NH Natural Heritage. Please address future correspondence to me at: Amy.Lamb@dred.nh.gov

Amy Lamb
Ecological Information Specialist
NH Natural Heritage Bureau
DRED - Forest & Lands
172 Pembroke Rd
Concord, NH 03301
603-271-2215 ext. 323

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2016-SLI-0140
Event Code: 05E1NE00-2018-E-03859
Project Name: Portsmouth 27690

April 27, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2016-SLI-0140

Event Code: 05E1NE00-2018-E-03859

Project Name: Portsmouth 27690

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Project to rehabilitate bridge that carries US Route 1 Bypass over Hodgson Brook. The existing bridge was constructed in 1940 and is comprised of five concrete boxes, with a total length of 45 feet and a width of 72 feet curb to curb.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.069475600545886N70.77830804785147W

Counties: Rockingham, NH

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Cultural Resources Staff
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

RECE[illegible]

2015

	7298
	___/___/___
R[illegible]ponse Date	___/___/___
Sent Date	___/___/___

Request for Project Review by the New Hampshire Division of Historical Resources for [illegible] Projects

☒ This is a new submittal.
☐ [illegible] is additional information [illegible] to DHR Review and Compliance (R&C)#:

GENERAL PROJECT INFORMATION

DOT Project N[illegible] & Number Portsmouth [illegible]

Brief Descriptive Project Title Bridge Rehabilitation or Replacem[illegible]

Project Location US Route 1 Bypass over Hodgson Brook

City/Town Portsmouth

Lead Federal Agency and Contact *(if applicable)* FHWA
(Agency providing funds, licenses, or permits)

Permit Type and Per[illegible] # X-A003(589)

DOT Environmental Manager [illegible] Marc Laurin

PRO[illegible] INFORMATION

Project Sponsor Name [illegible]ob Landry

Mailing Address 7 Hazen Drive **Phone Number** 603 271-3734

City [illegible] **State** NH **Zip** 03302 **Email** rlandry@dot.state.nh.us

CONTACT PERSON TO RECEIVE [illegible]SPONSE

Name/Company Christin[illegible] Perron, McFarland Johnson

Mailing Address [illegible] Drive **Phone Number** 603 225-2978

City [illegible] **State** NH **Zip** 03301 **Email** cperron@mjinc.com

This form is updated periodically. Please [illegible] http://www.nh.gov/nhdhr/review. [illegible] self-addressed stamped envelope to expedite review response. Project submi[illegible] will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and suppo[illegible] with a review request, including photographs and publications, will be retained by the DOT and the DHR as part of its review records. Items to be kept confidential should be clearly [illegible] at: http://www.nh.gov/nhdhr/review [illegible] christina.st.louis@dcr.nh.gov [illegible] 8.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION

Project Boundaries and Description

☒ Attach the relevant portion of a 7.5' USGS Map (photocopied or computer-generated) ***indicating the proposed area of potential effect (APE).*** *(See RPR for Transportation Projects Instructions and R&C FAQs for guidance. Note that the APE is subject to approval by lead federal agency and SHPO.)*

☒ Attach a detailed narrative description of the proposed project.

☐ Attach current engineering plans with tax parcel, landscape, and building references, and areas of proposed excavation, if available.

☒ Attach photos of the project area/APE with mapped photo key (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Blank photo logs are available on the DHR website. Detailed photo captions can be used in place of a photo log.)*

☐ A DHR file review must be conducted to identify properties within or adjacent to the APE. Provide file review results in Table 1. *(Blank table forms are available on the DHR website.)*

File review conducted on: / / .*

****The DHR recommends that all survey/National Register nomination forms and their Determination of Eligibility (DOE) sheets are copied for your use in project development.*

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts, or landscapes within the APE? ☒ Yes ☐ No

If no, skip to Archaeology section. If yes, submit all of the following information:

☒ Attach completed Table 2.

☒ Photographs of ***each*** resource or streetscape located within the APE. Add to the mapped photo key and photo log noted above. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)

☒ Copies of National Register boundary (listed or eligible) mapping, and any National Register boundaries for listed and eligible properties in the RPR project. *(if applicable).*

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☒ Yes ☐ No

If yes, submit all of the following information:

☒ Description of current and previous land use and disturbances.

☒ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

AGENCY COMMENT *This Space for DOT and Division of Historical Resources Use Only*

Sent to DHR; Authorized DOT Signature: ______________________ Date: ____________

☐ Insufficient information to initiate review.

☐ Additional information is needed in order to complete review.

Comments: No archaeological issues.

Depending on the extent of possible rehabilitation alterations, or the potential for replacement, preparation of an Ind. Inventory form for the bridge is recommended. The size, design & intended use all indicate the potential for ind. significance. Determination of individual eligibility and character defining features would inform alternatives analysis.

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized DHR Signature: Laura A Black Date: December 18, 2015

US Army Corps of Engineers ®
New England District

New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	**Yes**	**No**
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/. The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	N/A	
2.7 What is the area of the proposed fill in wetlands?		
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?		
3. Wildlife	**Yes**	**No**
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index		X

3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?	X	
4. Flooding/Floodplain Values	**Yes**	**No**
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	N/A	
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.
** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

Portsmouth 27690
US Route 1 Bypass over Hodgson Brook

ACOE Appendix B Supplemental Narrative

1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water?

The NHDES 2016 List of Impaired Waters (most recent available) identifies Hodgson Brook as being impaired for aquatic life due to chloride, dissolved oxygen saturation, pH, and impaired benthic macroinvertebrate bioassessments. The proposed project is not anticipated to have any effect on the pollutants or conditions responsible for these impairments.

3.1 Has the NHB and USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project?

The NH Natural Heritage Bureau did not identify recorded occurrences for sensitive species or exemplary natural communities at or in the vicinity of the project area.

The USFWS Information, Planning, and Conservation System (IPaC) web tool was utilized to determine if federally listed species have the potential to occur in the project area. According to IPaC, the Federally-threatened northern long-eared bat is a potential concern in this region of New Hampshire. Neither the Natural Heritage Bureau nor NH Fish & Game reported known bat hibernacula or roost trees in the vicinity of the project. The bridge was reviewed for evidence of bat roosting and no evidence was observed. Limited tree clearing will be required for construction access. All work will comply with the criteria of the USFWS-FHWA Rangewide Programmatic Consultation for Indiana Bat and Northern Long-Eared Bat. The USFWS has expressed no concern with the project as proposed.

5. Historic/Archaeological Resources
Has a copy of the Request for Project Review (RPR) Form been sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document?

An RPR was submitted to NHDHR in December 2015. U.S. Route 1 Bypass is eligible for listing on the National Register as a historic district, beginning at its divergence with U.S. Route 1 and continuing to the Sarah Mildred Long Memorial Bridge. The bridge that carries Hodgson Brook under the Bypass is a contributing element of the historic district. NHDHR has requested that an Inventory Form be completed to determine the individual eligibility of the bridge. Completion of this form is underway. Once the form is completed, NHDOT and FHWA will continue consultation with NHDHR to make a determination of effect. A Phase IA archaeological survey was completed and found no areas of sensitivity.

Photo 1 – Facing downstream side of Bridge 192/106 and Impact Location C
Photograph taken 10/13/2015.

Photo 2 – Facing upstream toward Bridge 192/106 and Impact Locations A, B
Photograph taken 10/13/2015.

Unless otherwise noted, photos are from Google Street View, dated September 2011.

Photo 3 – Impact Location G. Photograph taken 10/13/2015.

Photo 4 – Impact Locations D,F. Photograph taken 10/13/2015.

Unless otherwise noted, photos are from Google Street View, dated September 2011.

Photo 5 – Impact Locations D, E. Photograph taken 10/13/2015.

Photo 6 – Standing at Bridge 192/106 facing north

Unless otherwise noted, photos are from Google Street View, dated September 2011.

Photo 7 – Facing north toward intersection of Coakley Road and Cottage Street

Unless otherwise noted, photos are from Google Street View, dated September 2011.

NH Department of Transportation
Bureau of Bridge Design
Portsmouth, 27960

Construction Sequence

- The advertisement date is July 04, 2018.
- Start of construction is April 2019.
- U.S. Route 1 Bypass bridge repair, and mill and overlay will take place in summer 2019.

Work in the roadway:

Phase 1

1. Using appropriate traffic control procedures to the satisfaction of the Engineer, install portable concrete barrier (braced), construction signage, and traffic control appurtenances. Remove median and adjust lanes.

2. Construct temporary erosion control (i.e. perimeter controls). The temporary erosion and perimeter controls will be maintained throughout construction.

3. The work area is limited to 1'-6" from the back of the braced concrete barrier. Remove existing bridge rail, retaining wall, granite curbing, and superstructure.

4. Construct moment slab.

5. Install brush curb and t3 bridge rail.

6. Backfill work area to match existing cross slope and vertical profile.

7. Install new wearing surface to impacted work area.

Phase 2

1. Using appropriate traffic control procedures to the satisfaction of the Engineer, shift traffic, install portable concrete barrier (braced), construction signage and traffic control appurtenances. Adjust lanes.

2. The work area is limited to 1'-6" from the back of the braced concrete barrier. Remove existing bridge rail, retaining wall, granite curbing, and superstructure.

3. Construct moment slab.

4. Install brush curb and t3 bridge rail.

5. Backfill work area to match existing cross slope and vertical profile.

6. Install new wearing surface to impacted work area.

7. Install new median.

Work in the brook to be performed during low flow:

1. Contractor shall dig 3 test pits in cell 1 and engineer shall determine if repairs are warranted.

2. Contractor shall install water diversion upstream to close off cells during rehabilitation. A minimum of a single cell must remain open for water diversion at all times.

3. Contractor shall shore and temporarily support culvert ceiling prior to commencing rehabilitation work.

4. Concrete repairs shall be 5 feet inward from the face of the downstream and upstream culvert.

5. Concrete repairs shown at the floor elevation and at the base of the cell wall are typical for full length of each cell for cells 2 through 5.

6. Perched outlet shall be incrementally corrected with imported streambed material to coincide with water diversion.

7. After completion of repairs, water diversion measures shall be relocated and adjusted to channel water through completed cells.

8. Process shall be repeated until all cells have been repaired.

PORTSMOUTH
27690

May 10, 2018

SPECIAL PROVISION

AMENDMENT TO SECTION 585 – STONE FILL

Item 585.340 – Simulated Streambed Material

Add to Description:

1.2 This work shall consist of furnishing and placing Simulated Streambed Material in the stream channel of Hodgson Brook at the outlet of Bridge 192/106.

1.2.1 The Simulated Streambed Material shall be placed in this location as shown on the contract plans. The approximate percentage of specific streambed material was determined in the field from a visual assessment of existing channel substrate.

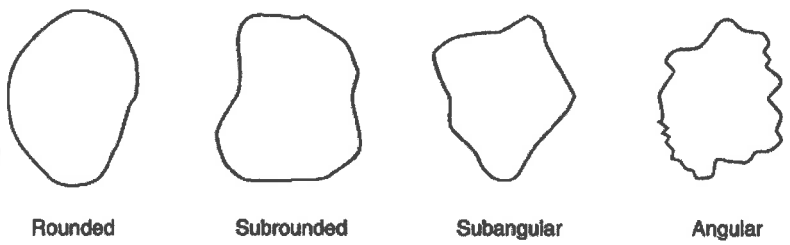
Add to Materials:

2.1.6 Simulated Streambed Material shall consist of the following gradation

	% by Weight	Sieve Sizes (in)
Sand	25%	0.003 to 0.08 (smaller than head of a match)
Gravel	45%	0.08 to 2.5 (between head of match and tennis ball)
Cobble	30%	2.5 to 10.00 (between tennis ball and volleyball)
Boulder	0%	10.0 or greater (larger than volleyball)

Streambed Material depth shall be as required to match the invert elevation at the bridge outlet and shall be tapered to match the existing stream channel as shown on the plans.

Particle shape shall be Sub-rounded and Sub-angular, generally conforming to the following:



Add to 3.1:

3.1.3 In accordance with the *Guidelines for Naturalized River Channel Design and Bank Stabilization*, specifically 2.2.1.2 Semi-Natural Form Design, the Streambed Material shall be placed directly on the existing channel floor as shown in the contract plans.

3.1.4 Contractor shall place the streambed simulation material in lifts with a thickness of less than 1½ times the maximum dimensions of the rocks. The Streambed Material shall be placed using methods that do not cause segregation or damage to the surface below. Individual rocks shall be placed or rearranged using methods to obtain a compact, low permeability material. Voids shall be filled in prior to placing the next fill. The river material shall not allow for subsurface flow.

Method of Measurement

Add to Method of Measurement:

4.2 Simulated Streambed Material will be measured by the cubic yard.

Basis of Payment

Add to Basis of Payment:

5.1.1 The accepted quantity of Simulated Streambed Material will be paid for at the Contract unit price per cubic yard complete in place.

Add to Pay Items and Units:

585.340	Simulated Streambed Material	Cubic Yard

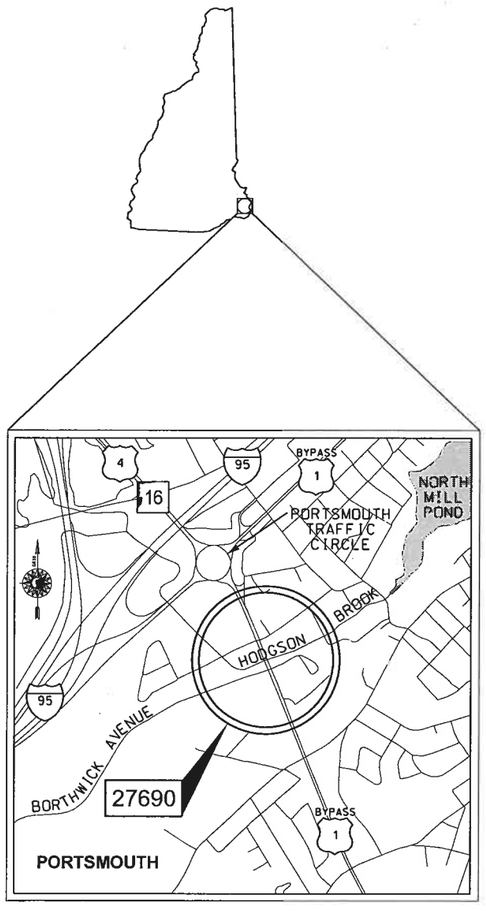
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLAND PLANS
FEDERAL AID PROJECT

FEDERAL AID PROJECT NO. X-A003(589)
NH PROJECT NO. 27690
US 1 BY-PASS CULVERT REHABILITATION,
US 1 BY-PASS OVER HODGSON BROOK BR. NO. 192\106

DESIGN DATA
US ROUTE 1 BY-PASS

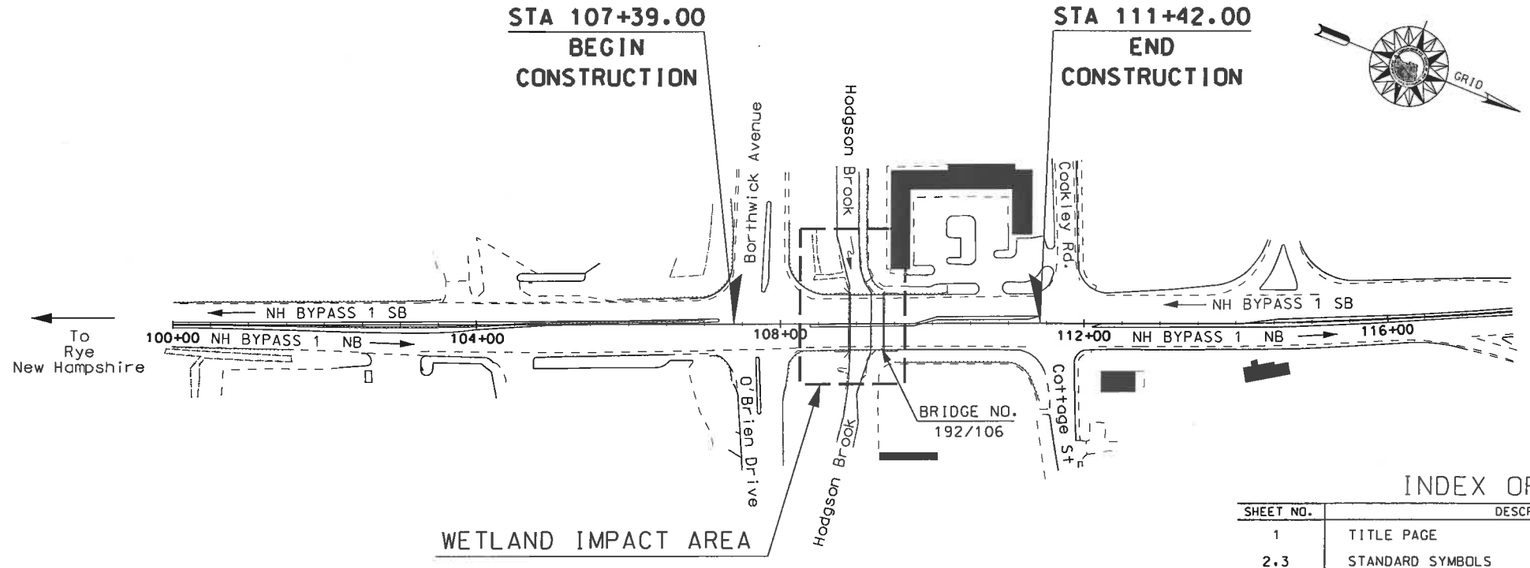
	2017	2019
AVERAGE DAILY TRAFFIC	21,848	22,700
PERCENT OF TRUCKS	XX	XX
DESIGN SPEED	35	35
LENGTH OF PROJECT	0.1 MILE	0.1 MILE



LOCATION MAP

1/4 1/8 0 1/4 1/2mi.

GRAPHIC SCALE



INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE PAGE
2.3	STANDARD SYMBOLS
4	WETLAND IMPACT SUMMARY SHEET & CHANNEL SECTION
5	WETLAND PLAN
6	EROSION CONTROL STRATEGIES
7	EROSION CONTROL PLAN

CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM

SCALE = 1" = 200'

DRAWN BY SLM DATE 5/2018
CHECKED BY CJP DATE 5/2018

WETLAND PLANS PREPARED BY
McFarland Johnson
McFARLAND JOHNSON
CONCORD, N.H.
DELINEATION: October 13, 2015

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE THE CONSTRUCTION PLANS

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

MUNICIPAL HIGHWAYS ENGINEER
BUREAU OF PLANNING AND COMMUNITY ASSISTANCE — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

DRAWING NAME	FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
27690fsc.dgn	X-A003(589)	27690	1	7

GENERAL

EDGE OF PAVEMENT
TRAVELED WAY
PROPOSED ROADWAY
existing roadway
(pavement removed outside slope lines)

DRIVEWAYS
(label surface type)

BUILDINGS
(building to be removed)
(label house or type of building)

FOUNDATION
(label type)

LEACH FIELD
leach field

BRIDGE CROSSINGS
STREAM
OVERPASS

STEPS AND WALK
(label type)

INTERMITTENT WATER COURSE

SHORE LINE
river/stream
pond
(label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)
(deciduous) (coniferous) (stump)
(show station, circumference in feet & type)

TREE OR STUMP (CROSS-SECTIONS)

HEDGE
(label type)

MONITORING WELL
mon

WELL

FLAG POLE
fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type)
existing
PROPOSED
bgr
cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)
(points toward retained ground)

FENCE (LABEL TYPE)

SIGNS
(single post)
(double post)

GAS PUMP
gp

FUEL TANK (ABOVE GROUND)
ft
(label size & type)

STORAGE TANK FILLER CAP
fc

SEPTIC TANK
S

GRAVE
gr

MAILBOX
mb

VENT PIPE
vp

SATELLITE DISH ANTENNA
da

PHONE
ph

GROUND LIGHT/LAMP POST
gl
lp

BORING LOCATION
B

TEST PIT
TP

INTERSTATE NUMBERED HIGHWAY
293

UNITED STATES NUMBERED HIGHWAY
3

STATE NUMBERED HIGHWAY
102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE
2
PUB2E

DELINEATED WETLAND — DW
ORDINARY HIGH WATER — OHW
TOP OF BANK — TOB
TOP OF BANK & ORDINARY HIGH WATER — TOBOHW
NORMAL HIGH WATER — NHW
WIDTH AT BANK FULL — WBF
PRIME WETLAND — PWET
PRIME WETLAND 100' BUFFER — PWET100
NON-JURISDICTIONAL DRAINAGE AREA — NJDA
COWARDIN DISTINCTION LINE — CDL
TIDAL BUFFER ZONE — TBZ
DEVELOPED TIDAL BUFFER ZONE — DTBZ
HIGHEST OBSERVABLE TIDE LINE — HOTL
MEAN HIGH WATER — MHW
MEAN LOW WATER — MLW
VERNAL POOL — VP
SPECIAL AQUATIC SITE — SAS
REFERENCE LINE — REF
WATER FRONT BUFFER — WB50
NATURAL WOODLAND BUFFER — NWB150
PROTECTED SHORELAND — PS250
INVASIVE SPECIES LABEL
I.S. I
I.S. II
INVASIVE SPECIES — INV

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500
100 YEAR FLOODPLAIN BOUNDARY — FP100
FLOODWAY — FW

ENGINEERING

CONSTRUCTION BASELINE
30 31 32

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

SLOPE LINE
CLEARING LINE

CLEARING LINE

SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT) 72.5
FINISHED GRADE ELEVATION (RIGHT) 79.14

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN
STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	27690stdsymb	27690	2	7

DRAINAGE

MANHOLE
CATCH BASIN
DROP INLET
(existing)
(PROPOSED)

DRAINAGE PIPE (existing)
DRAINAGE PIPE (PROPOSED)
(label size & type)

UNDERDRAIN (existing) W/ FLUSHING BASIN
UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN
show direction of flow
(label size & type)

HEADER (existing & PROPOSED)
(with stone outlet protection)

END SECTION (existing & PROPOSED)
METAL or PLASTIC
RCP

OPEN DITCH (PROPOSED)

EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE (label type)
RR RIGHT-OF-WAY LINE
PROPERTY LINE
PROPERTY LINE (COMMON OWNER)
TOWN LINE — BOW / CONCORD
COUNTY LINE — COOS / GRAFTON
STATE LINE — MAINE / NEW HAMPSHIRE
NATIONAL FOREST
CONSERVATION LAND
BENCH MARK / SURVEY DISK
BOUND (PROPOSED)
STATE LINE/ TOWN LINE MONUMENT — S/L, T/L
NHDOT PROJECT MARKER
IRON PIPE OR PIN
DRILL HOLE IN ROCK
TAX MAP AND LOT NUMBER — 156 / 14 — 1642/341 — 6.80 Ac.±
PROPERTY PARCEL NUMBER — 12
HISTORIC PROPERTY

UTILITIES

existing / PROPOSED

TELEPHONE POLE
POWER POLE
JOINT OCCUPANCY
MISCELLANEOUS/UNKNOWN POLE
GUY POLE OR PUSH BRACE
(plot point at face not center of symbol)

LIGHT POLE
LIGHT ON POWER POLE
LIGHT ON JOINT POLE

POLE STATUS: REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.: R, L, P+04 25.0', T+04 25.0'

RAILROAD (label ownership)
RAILROAD SIGN
RAILROAD SIGNAL
UTILITY JUNCTION BOX — jb / JB
OVERHEAD WIRE — OW — (label type)

UNDERGROUND UTILITIES

WATER (on existing lines label size, type and note if abandoned) — W / PW
SEWER — S / PS
TELEPHONE — T / PT
ELECTRIC — E / PE
GAS — G / PG
LIGHTING — L / PL
INTELLIGENT TRANSPORTATION SYSTEM — ITS / PITS
FIBER OPTIC — FO / PFO
WATER SHUT OFF
GAS SHUT OFF
HYDRANT

MANHOLES
SEWER — MHS
TELEPHONE — MHT
ELECTRICAL — MHE
GAS — MHG
UNKNOWN

TRAFFIC SIGNALS / ITS

existing / PROPOSED

MAST ARM (existing) — 30' MA (NOTE ANGLE FROM ℄)
OPTICOM RECEIVER
OPTICOM STROBE
TRAFFIC SIGNAL
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT
SIGNAL CONDUIT — C / PC
CONTROLLER CABINET — cc / CC
METER PEDESTAL — mp / MP
PULL BOX — pb / PB
LOOP DETECTOR (QUADRUPOLE) — (label size)
LOOP DETECTOR (RECTANGULAR) — (label size)
CAMERA POLE (CCTV)
FIBER OPTIC DELINEATOR — fod / FOD
FIBER OPTIC SPLICE VAULT — SVF
ITS EQUIPMENT CABINET — its / ITS
VARIABLE SPEED LIMIT SIGN
DYNAMIC MESSAGE SIGN
ROAD AND WEATHER INFO SYSTEM

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS — B-1
CURB MARK NUMBER - GRANITE — G-1
CLEARING AND GRUBBING AREA — A
DRAINAGE NOTE — 1
EROSION CONTROL NOTE — A
FENCING NOTE — A
GUARDRAIL NOTE — 1
ITS NOTE — 1
LIGHTING NOTE — A
TRAFFIC SIGNAL NOTE — 1

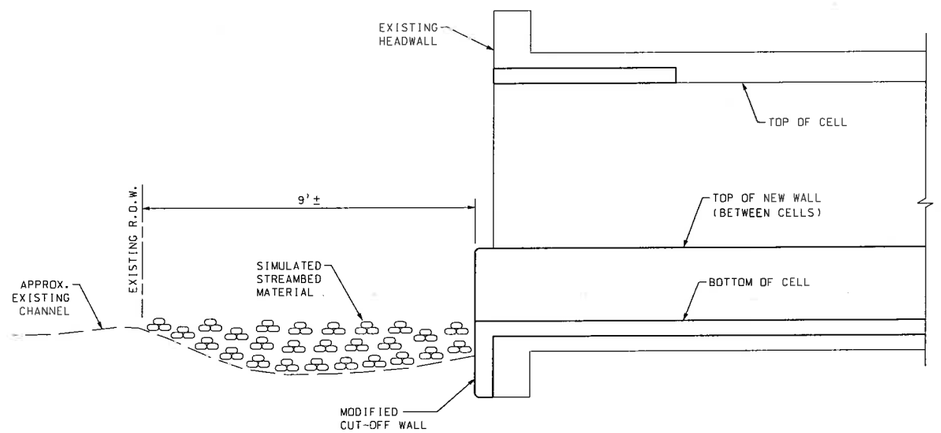
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	27690stdsymb	27690	3	7

WETLAND IMPACT SUMMARY - NEW HAMPSHIRE									
WETLAND NUMBER	WETLAND CLASS-IFICATION	LOCATION	AREA IMPACTS						COMMENTS
			PERMANENT				TEMPORARY		
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)				
			SF	LF	SF	LF	SF	LF	
1	R2UB1H	A			247	9			
1	R2UB1H	B					639	20	
4	BANK	C					384	20	
1	R2UB1H	D					1517	30	
3	BANK	E					8	4	
2	BANK	F					156	16	
7	PSS1E	G					129	20	
		TOTAL			247		2833		

PERMANENT IMPACTS:	247 SF
TEMPORARY IMPACTS:	2833 SF
TOTAL IMPACTS:	3080 SF



SECTION THRU CHANNEL (OUTLET END)
SCALE: 1/2" = 1'-0"

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED	NHDOT	DATE 03-2018
NEW DESIGN	MJ	DATE 03-2018
SHEET CHECKED	BRC	DATE 03-2018
AS BUILT DETAILS		DATE

McFarland Johnson

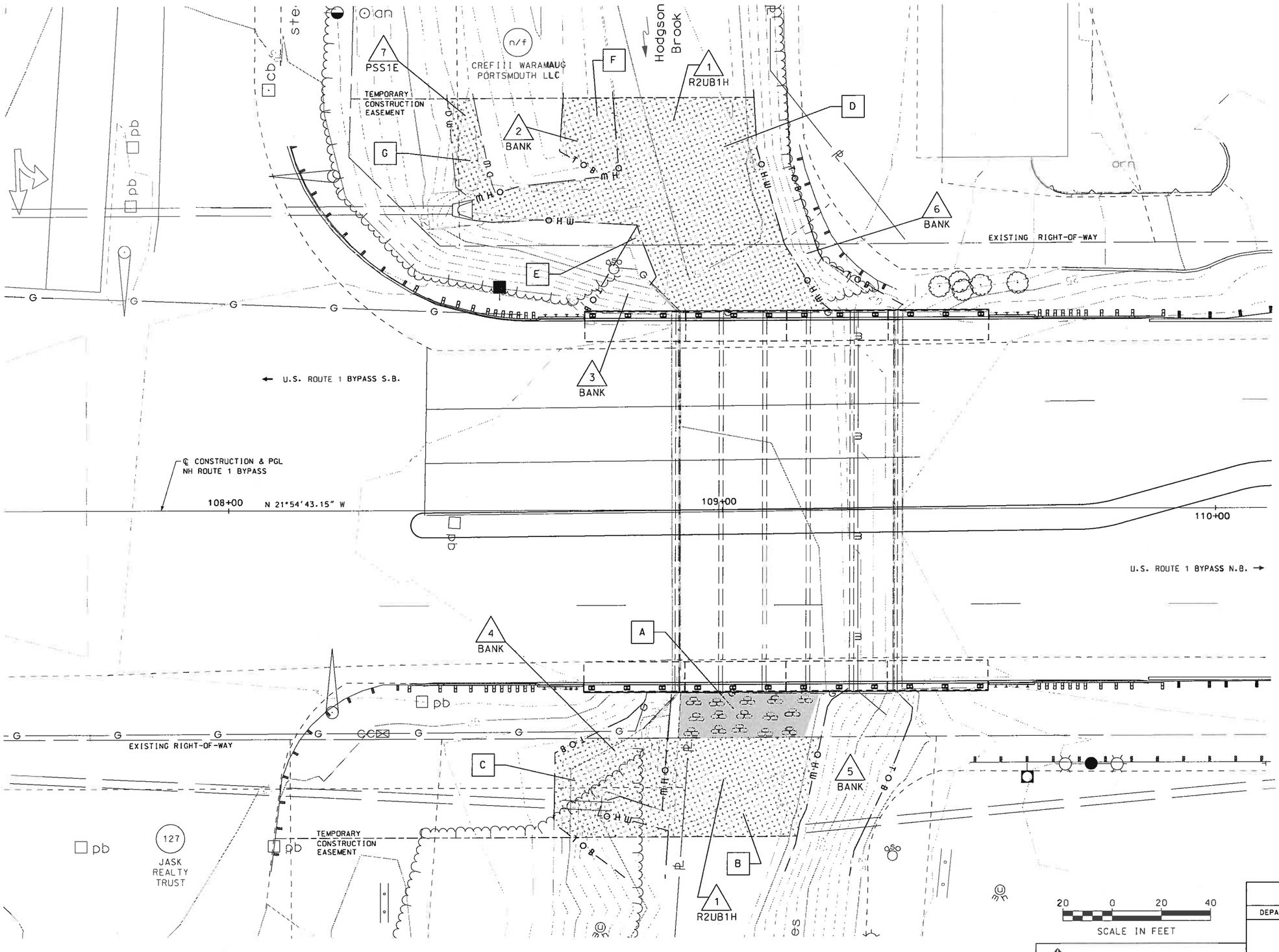
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
WETLAND IMPACT SUMMARY SHEET & CHANNEL SECTION

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
27690wetsum	27690	4	7

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

		DATE
SDR PROCESSED	NHDOT	05-2018
NEW DESIGN	MJ	05-2018
SHEET CHECKED	CJP	05-2018
AS BUILT DETAILS		DATE



LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS	

△ # WETLAND DESIGNATION NUMBER

□ # WETLAND IMPACT LOCATION

WETLAND PLAN

McFarland Johnson

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

WETLAND PLAN

OGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
27690wetplan	27690	5	7

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
   1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
   1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
   1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
   1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
   1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WQ 1500 REQUIREMENTS (HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM)
   1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.

2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
   2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
   2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
   2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
   2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
      (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
      (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
      (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
      (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
   2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
   2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
   2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
   2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30" AND MAY 1" OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
      (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
      (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
      (C) AFTER NOVEMBER 30" INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
      (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER STABILIZATION PLAN HAS BEEN APPROVED BY NHDOT.
      (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WQ 1505.05) NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30".

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
   3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
   3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
   3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
   3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
   3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.

4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
   4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
   4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
   4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1" THROUGH NOVEMBER 30". OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.

5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
   5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
   5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
   5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
   5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
   5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.

6. PROTECT SLOPES:
   6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
   6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
   6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
   6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.

7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
   7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
   7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.

8. PROTECT STORM DRAIN INLETS:
   8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
   8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
   8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
   8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.

9. SOIL STABILIZATION:
   9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
   9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
   9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
   9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
   10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WQ 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER.
      TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
   10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
   10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
   11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
   11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
   11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
   11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
   11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
   11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
   11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
   11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
   11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
   12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
   12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
   12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
   12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
   12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
   12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
   12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.

13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
   13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
   13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
   13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
   13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.

14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
   14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
   14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
   14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WQ 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES*	YES*	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

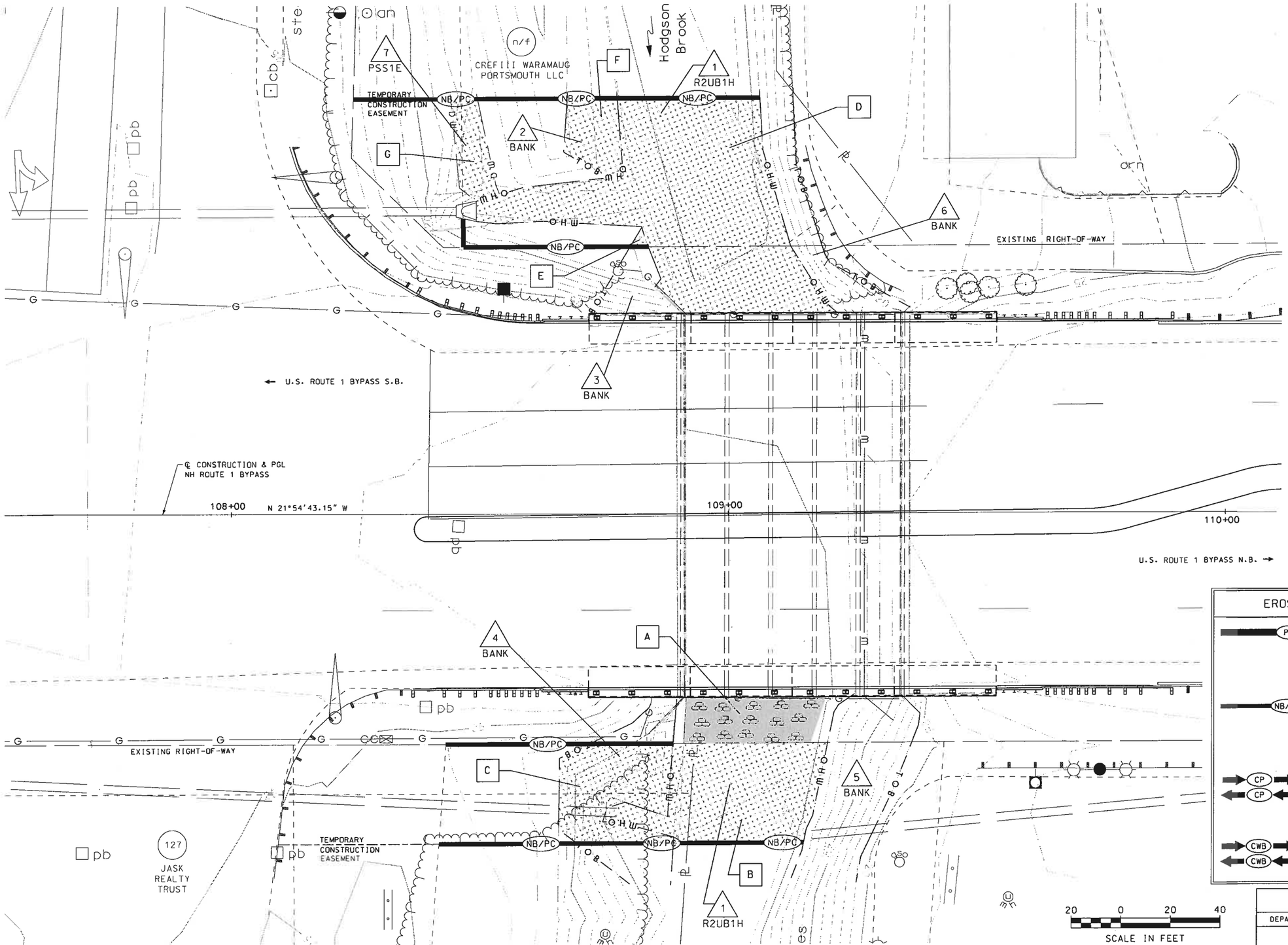
EROSION CONTROL STRATEGIES

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	27690erostr.dgn	27690	6	7

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED	NHDOT	DATE 05-2018
NEW DESIGN	MJ	DATE 05-2018
SHEET CHECKED	CJP	DATE 05-2018
AS BUILT DETAILS		DATE



EROSION CONTROL PLAN

EROSION CONTROL PLAN LEGEND

- PC — PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- NB/PC — NATURAL BUFFER/PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- CP — CHANNEL PROTECTION
  - STONE CHECK DAMS
  - STRAW WATTLES
  - CHANNEL MATTING
  - CLASS D EROSION STONE
  - CLASS C STONE
- CWB — CLEAN WATER BYPASS
  - PUMP THROUGH PIPE
  - DRAIN THROUGH PIPE OR CHANNEL

McFarland Johnson

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EROSION CONTROL PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
27690eroplan	27690	7	7